REMARKS

This paper is responsive to the Non-Final Office Action mailed on September 20, 2005. Claims 1-20 were examined and rejected. Applicants thank the Examiner for a detailed and thoughtful examination of all claims.

Claims 1-20 remain in this application for further examination, wherein claims 7-12, 14, 15, 18, and 19 are currently amended.

Corrections for spelling informality

Claims 7-12, 14, 15, 18, and 19 are currently amended by correcting the spelling error "Themethod" to -- The method --.

Claim Rejections – 35 U.S.C. §102(e)

Claims 1-10 and 12-19 stand rejected under 35 U.S.C. §102(e) as being anticipated by Van Auken (U.S. Pat. No. 6,577,110). This rejection is respectfully traversed.

Regarding the independent claim 1, one limitation that should be paid special attention to is cited below:

> *"reducing a duty cycle of the PFM switching signal when the output voltage is lower than a predetermined target voltage"*

According to this limitation, the duty cycle of the PFM switching signal is reduced in response to **the output voltage (V_{out})**, rather than the inductor current (I_L).

However, it is **the inductor current (I_L)** that Van Auken teaches to trigger the reduction of the duty cycle of the PFM switching signal. Such teaching can be apparently recognized from Van Auken's column 4, line 53 to column 5, line 14 in association with FIG. 2, of which the left half is illustrating CCM (Continuous Conduction Mode) and the right half is illustrating DCM (Discontinuous Conduction

Mode). In CCM, the OFF-time of the switch is determined by the pulse of DCHG. In DCM, the OFF-time of the switch is extended by the pulse of UCT in addition to the pulse of DCHG. Since the ON-times of the switch in CCM and DCM, both of which are determined by the pulse of CHG, are almost the same, the longer OFF-time in DCM, i.e. DCHG+UCT, has an effect on reducing the duty cycle of the PFM switching signal. As also clearly described in column 4, lines 30-52 of Van Auken, the inductor current (I_L) is the criterion to distinguish between CCM and DCM, and therefore the very cause to trigger the reduction of the duty cycle of the PFM switching signal.

Because neither Van Auken nor the prior art made of record in the Non-Final Office Action discloses or suggests the limitation of **reducing the duty cycle in response to the output voltage (V_{out})**, the independent claim 1 is thus believed to be allowable over the art of record, and all claims dependent therefrom are likewise believed to be allowable at least for this reason.

Regarding the independent claim 13, the limitation "***prolonging*** *a period of delivering energy from the inductive means to the capacitive means when* ***the output voltage*** *is lower than a predetermined target voltage*" still has nothing to do with **the generation of UCT in response to the inductor current (I_L)** disclosed in Van Auken, for the same reason carefully and specifically argued earlier. Thus, the independent claim 13 is believed to be allowable over the art of record, and all claims dependent therefrom are likewise believed to be allowable.

Regarding the independent claim 17, the limitation "***shortening*** *a period of storing energy in the inductive means when* ***the output voltage*** *is lower than a predetermined target voltage*" still has nothing to do with **the generation of UCT in response to the inductor current (I_L)** disclosed in Van Auken, for the same reason carefully and specifically argued earlier. Thus, the independent claim 17 is believed

to be allowable over the art of record, and all claims dependent therefrom are likewise believed to be allowable.

It should be further noted that the circuit mentioned in Van Auken's column 3, line 51 to column 4, line 29 is directed only to a PFM converter with **a predetermined ON-time** (especially referring to column 3, lines 60-63). Based on this fact, Van Auken fails to disclose or suggest a PFM converting method with **a predetermined OFF-time**, which is exactly one of the limitations recited in claims 2-4 and 12. Furthermore, the predetermined OFF-time described in each of claims 2-4 and 12 is a **minimum**. Not any of such features regarding the OFF-time of the PFM switching signal is anticipated by Van Auken.

On the other aspect, the predetermined ON-time that is certainly described in Van Auken is actually a minimum (see column 3, lines 60-63: for **at least** a predetermined time period), which inherently suggests the ON-time in effect cannot be shortened any further from such a predetermined minimum. However, each of claims 5-7 and 12 includes a limitation of "***shortening a predetermined constant ON-time*** *of the PFM switching signal*" as one of at least two ways to reduce the duty cycle of the PFM switching signal, which still cannot be anticipated by Van Auken.

Although it is undoubtedly for Van Auken to have been comparing the output voltage V_o with the predetermined voltage as taught in column 3, line 51 to column 4, line 29 and particularly pointed out by the Examiner, such comparison is only designated to determine during every single switching cycle whether and when the switch should be turned off from on or turned on from off. As a consequence for Van Auken, the predetermined minimum ON-time remains unchanged, and therefore the duty cycle of the PFM switching signal remains unchanged, regardless of the comparison of the output voltage V_o with the predetermined voltage.

Claim Rejections – 35 U.S.C. §103(a)

Claims 11 and 20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Van Auken in view of Yamada et al. (U.S. Pat. No. 6,714,425). This rejection is respectfully traversed.

Since Van Auken fails to serve as the rejection ground of 35 U.S.C. §102(e) to independent claims 1 and 17 as carefully and specifically argued earlier, Van Auken in view of Yamada et al. automatically fail to serve as the rejection ground of 35 U.S.C. §103(a) to claims 11 and 20 that respectively depend on claims 1 and 17.

Summary

In summary, claims 1-20 are pending in the application with a few corrections for spelling informality. No amendment has been initiated for the purpose of trying to overcome the rejections under 35 U.S.C. §102(e) and §103(a) stated in the Non-Final Office Action. Through careful and reasonable arguments, all of claims 1-20 are believed to be allowable over the art of record, and a Notice of Allowance to that effect is respectfully solicited.

Respectfully submitted,

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